

**DETECTING MISLABELLING OF PACKAGED  
FROZEN SEAFOOD PRODUCTS IN SRI LANKA:  
A DNA BARCODING APPROACH**

A dissertation submitted to the  
Faculty of Animal Science and Export Agriculture  
Uva Wellassa University  
in partial fulfillment of the requirement of  
the degree of  
Bachelor of Science in Aquatic Resources Technology

By

**APAREKA GAMAGE DINUSHA MADHUBHASHINI PERERA**

**Aquatic Resources Technology Degree Programme  
Department of Animal Science  
Faculty of Animal Science and Export Agriculture  
Uva Wellassa University of Sri Lanka**

**2018**

## Abstract

The seafood trade has conquered a vast market in global, as well as the local context. Substitution of high value seafood species with those of low cost has become an emerging problem for the expanding market, since some of the products are visually unrecognizable and morphologically indistinguishable. The objective of this study was to assess the suitability of DNA barcoding as a method for species identification of packaged seafood to detect any mislabelling. Eight packaged frozen seafood product samples including finfish, crab, shrimp and cuttlefish were obtained from randomly selected supermarkets and subjected to DNA extraction. Mitochondrial cytochrome oxidase subunit I gene (COI) was amplified in those samples with appropriate primers. Then five successful PCR products of tuna (T1 & T2), sailfish (SF1 & SF2) and crab (C1) were selected for sequencing to obtain DNA barcodes. The prepared DNA sequences were compared with the Barcode of Life Database (BOLD) system for species identification. Closely related sequences for each sample were downloaded from NCBI Genbank and phylogenetic trees were constructed using Maximum Parsimony, Maximum Likelihood and Neighbour Joining methods. Samples were identified as follows, T1 - *Thunnus albacares* (100%) and T2 - *Thunnus alalunga* (99.85%), SF1 and SF2 - *Istiophorus platypterus* (100%) and C1 - *Portunus pelagicus* (97.71%). Identical tree topologies resulted from all three methods and three major clades were revealed in the phylogenetic tree as tuna, sailfish and crab groups. All five selected samples matched with more than 95% identification percentage showing that correct labelling had been done by the packaging companies. This study concluded that DNA barcoding is a feasible, efficient and reproducible method for detection of mislabelling of packaged frozen seafood products.